

Data User Guide

GPM Ground Validation NASA Micro Rain Radar (MRR) HyMeX

Introduction

The GPM Ground Validation NASA Micro Rain Radar (MRR) HyMeX is a vertically pointing Doppler radar that obtained measurements of vertical velocity, drop size distribution, rainfall rate, attenuation, liquid water content, and reflectivity factor during the HYdrological cycle in Mediterranean EXperiment (HyMeX) campaign. The project took place in the Mediterranean from September 5 to November 6, 2012. The data are in ASCII format.

Citation

Petersen, W., P. Gatlin, and M. Wingo. 2015. GPM Ground Validation NASA Micro Rain Radar (MRR) HyMeX [indicate subset used]. Dataset available online [ftp://gpm.nsstc.nasa.gov/gpm_validation/related_projects/hymex/mrr_NASA/] from the NASA EOSDIS Global Hydrology Resource Center Distributed Active Archive Center, Huntsville, Alabama, U.S.A. doi: <http://dx.doi.org/10.5067/GPMGV/HYMEX/MRR/DATA201>

Keywords:

GHRC, GPM GV, HyMeX; Mediterranean, Alés, France, Rome, Italy; radar, micro rain radar, Doppler radar; vertical velocity, drop size distribution, rainfall rate, attenuation, liquid water content, reflectivity factor;

Campaign

The Global Precipitation Measurement (GPM) mission Ground Validation (GV) campaign used a variety of methods for validation of GPM satellite constellation measurements prior to launch of the GPM Core Satellite, which launched on February 27th, 2014. The validation effort included numerous GPM-specific and joint-agency/international external field campaigns, using state of the art cloud and

precipitation observational infrastructure (polarimetric radars, profilers, rain gauges, disdrometers). Surface rainfall was measured by very dense rain gauge and disdrometer networks at various field campaign sites. These field campaigns accounted for the majority of the effort and resources expended by Global Precipitation Measurement (GPM) mission Ground Validation (GV). More information about the GPM mission is available at <http://pmm.nasa.gov/GPM>.

The HYdrological cycle in Mediterranean EXperiment (HyMeX) aimed to improve the understanding, quantification and modelling of the hydrological cycle in the Mediterranean, with emphasis on the predictability and evolution of extreme weather events, inter-annual to decadal variability of the Mediterranean coupled system, and associated trends in the context of global change. Furthermore, this campaign aimed to improve observational and modelling systems, better predict extreme events, simulate the long-term water-cycle, and provide guidelines for adaptation measures. Special Observation Period 1 (SOP1), which was from September 5 to November 6, 2012, was dedicated to heavy precipitation and flash-flooding. More information about HyMeX is available at <http://www.hymex.org/>.

Instrument Description

The GPM Ground Validation NASA Micro Rain Radar (MRR) is a vertically pointing Doppler radar which provided measurements of vertical velocity, drop size distribution, rainfall rate, attenuation, liquid water content, and reflectivity factor obtained during the HYdrological cycle in Mediterranean EXperiment (HyMeX) Special Observations Period (SOP), which took place in the northern Mediterranean region during the fall of 2012. An MRR was deployed in Alés, France and Rome, Italy. The dataset covers the period of September 30, 2012 through November 12, 2012, but each MRR deployed may not contain data during the entirety of this period. More information about the MRR can be found at <http://metek.de/product/mrr-2/>.

Site # / Instrument	Site	Site Coordinates	Latitude	Longitude	Altitude (m)
SN35	Alés, France	N44°08'13.8", E04°05'51.3"	44.137167	4.097583	150
SN36, APU, TB	Rome, Italy	N41°53'37.3", E12°29'37.8"	41.893694	12.493833	076

MRR2-2DVD co-located instruments

More detailed information about the GPM Ground Validation NASA Micro Rain Radar (MRR) HyMeX is available at ftp://gpm.nsstc.nasa.gov/gpm_validation/related_projects/hymex/mrr_NASA/doc/DataFormat_mrr_hymex.pdf.

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File Naming Convention

The MRR dataset files are named with the following convention:

`hymex_mrr_[site]_[date]_[latitude_longitude].tar.gz`

Where,

[site] = geographical region of MRR deployment

[date] = YYYYmmDD (e.g., 20110422)

[latitude_longitude]=geographic location of instrument (e.g.,
N363442.07_W0972640.90 is North 36°34'42.07" and West 97°26'40.90")

Data Format Description

The GPM Ground Validation NASA Micro Rain Radar (MRR) HyMeX data are available in ASCII format. The data processing level for the raw level data is 0, the processed/instantaneous Data is level 1, and the averaged data is level 2. More information about NASA data processing levels can be found at <http://science.nasa.gov/earth-science/earth-science-data/data-processing-levels-for-eosdis-data-products/>.

References

Peters, G., B. Fischer, H. Münster, M. Clemens, and A. Wagner. 2005. Profiles of Raindrop Size Distributions as Retrieved by Microrain Radars. *J. Appl. Meteor.*, 44, 1930–1949. doi: <http://dx.doi.org/10.1175/JAM2316.1>

Peters, G., B. Fischer, and M. Clemens. 2010. Rain Attenuation of Radar Echoes Considering Finite-Range Resolution and Using Drop Size Distributions. *J. Atmos. Oceanic Technol.*, 27, 829–842. doi: <http://dx.doi.org/10.1175/2009JTECHA1342.1>

2015. HYdrological cycle in Mediterranean EXperiment (HyMeX) website: <http://www.hymex.org/>

Contact Information

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